Amendment to the Claims

This listing of claims will replace all prior versions and listings of claims in the above-referenced application.

1. (currently amended) A macroscopic scaffold comprising amphiphilic peptides, wherein said peptides have alternating hydrophobic and hydrophilic amino acids, are complementary and structurally compatible, and self-assemble into a beta-sheet macroscopic scaffold; and wherein said macroscopic scaffold is formed by the peptides self-assembling to encapsulate ~~encapsulates~~ living cells, said cells being present in said macroscopic scaffold in a three-dimensional arrangement.

2. (original) The macroscopic scaffold of claim 1, further encapsulating a therapeutically active compound or chemoattractant.

3. (original) The macroscopic scaffold of claim 1, wherein said peptides comprise an adhesion site, growth factor binding site, growth factor, or sequence that provides targeting to a cell, tissue, organ, organ system, or site within an mammal.

4. (original) The macroscopic scaffold of claim 1, wherein said living cells are neurons and said macroscopic scaffold allows axonal outgrowth by said neurons.

5. (currently amended) The macroscopic scaffold of claim 1, wherein said cells are chondrocytes, bone marrow cells, osteocytes, periosteal ~~periosteal~~ cells, perichondrial cells, fibroblasts, neuronal cells, hippocampal cells, epidermal cells, endothelial cells, keratinocytes, basal cells, spinous cells, granular cells, embryonic stem cells, ovarian cells, pancreatic cells, cervical cells, liver cells, or foreskin cells.

6. (original) The macroscopic scaffold of claim 1, wherein said cells secrete extracellular matrix components.

7. (original) The macroscopic scaffold of claim 6, wherein said secretion of extracellular matrix components increases the equilibrium compression modulus of said macroscopic scaffold by at least 50 fold.

8. (currently amended) The macroscopic scaffold of claim 1, wherein at least 60% of the encapsulated cells are in cell-cell contact with another encapsulated cell ~~or with a cell outside of the scaffold~~.

9. (withdrawn) A method of forming a macroscopic scaffold, said method comprising the steps of:

(a) incubating peptides and living cells in an aqueous solution comprising an iso-osmotic solute, wherein said peptides have alternating hydrophobic and hydrophilic amino acids and are complementary and structurally compatible; and

(b) adding an electrolyte to said solution sufficient to initiate self-assembly of said peptides into a beta-sheet macroscopic scaffold, whereby said cells are encapsulated by the formation of said macroscopic scaffold and are present in said macroscopic scaffold in a three-dimensional arrangement.

10. (withdrawn) A method of forming a macroscopic scaffold of predetermined shape or volume, said method comprising the steps of:

(a) incubating peptides and living cells in an aqueous solution comprising an iso-osmotic solute, wherein said peptides have alternating hydrophobic and hydrophilic amino acids and are complementary and structurally compatible, wherein said solution is contained in a pre-shaped mold dimensioned to determine the volume or shape of said macroscopic scaffold; and

(b) adding an electrolyte to said solution sufficient to initiate self-assembly of said peptides into a beta-sheet macroscopic scaffold, whereby said cells are encapsulated by the formation of said macroscopic scaffold and are present in said macroscopic scaffold in a three-dimensional arrangement.

11. (withdrawn) A method of regenerating a tissue, said method comprising administering to a mammal a macroscopic scaffold comprising amphiphilic peptides, wherein said peptides have alternating hydrophobic and hydrophilic amino acids, are complementary and structurally compatible, and self-assemble into a beta-sheet macroscopic scaffold; and wherein said macroscopic scaffold encapsulates living cells, said cells being present in said macroscopic scaffold in a three-dimensional arrangement.

12. (withdrawn) A method of regenerating a tissue, said method comprising administering to a mammal a solution comprising amphiphilic peptides, living cells, and an iso-osmotic solute; wherein said peptides have alternating hydrophobic and hydrophilic amino acids and are complementary and structurally compatible, wherein said peptides do not substantially self-

assemble prior to said administration, and wherein said peptides self-assemble into a beta-sheet macroscopic scaffold after said administration, thereby encapsulating said cells *in vivo*, said cells being present in said macroscopic scaffold in a three-dimensional arrangement.

13. (withdrawn) The method of claim 11 or 12, wherein said method is used to treat or prevent a cartilage defect, connective tissue defect, nervous tissue defect, epidermal lining defect, endothelial lining defect, or arthritis.

14. (withdrawn) The method of claim 9, 10, or 11, further comprising subjecting said macroscopic scaffold to a predetermined compression scheme.

15. (withdrawn) The method of claim 14, wherein said compression scheme induces the secretion of extracellular matrix components by said cells.

16. (withdrawn) The method of claim 15, wherein said secretion of extracellular matrix components increases the equilibrium compression modulus of said macroscopic scaffold by at least 50-fold.

17. (withdrawn) The method of claim 9, 10, or 11, wherein at least 60% of the encapsulated cells are in cell-cell contact with another encapsulated cell.

18. (withdrawn) The method of claim 9 or 10, wherein said solution in step (a) contains less than 10 mM electrolyte, and wherein said peptides do not substantially self-assemble prior to step (b).

19. (new) The macroscopic scaffold of claim 1, wherein said cells are chondrocytes.

20. (new) The macroscopic scaffold of claim 1, wherein said amphiphilic peptides comprise multiple KLD subunits.

21. (new) The macroscopic scaffold of claim 1, wherein said scaffold further comprises a biodegradable sealant, glue, or polymer attached to the surface of the macroscopic scaffold.

22. (new) The macroscopic scaffold of claim 6, wherein said secretion of extracellular matrix components increases the strength of said macroscopic scaffold.

23. (new) The macroscopic scaffold of claim 6, wherein said secretion of extracellular matrix components increases the stiffness of said macroscopic scaffold.

24. (new) The macroscopic scaffold of claim 6, wherein said secretion of extracellular matrix components increases the equilibrium compression modulus of said macroscopic scaffold.

25. (new) The macroscopic scaffold of claim 24, wherein said secretion of extracellular matrix components increases the equilibrium compression modulus of said macroscopic scaffold by up to 50-fold.

26. (new) The macroscopic scaffold of claim 24, wherein said secretion of extracellular matrix components increases the equilibrium compression modulus of said macroscopic scaffold by up to approximately 2-fold.

27. (new) The macroscopic scaffold of claim 24, wherein said secretion of extracellular matrix components increases the equilibrium compression modulus of said macroscopic scaffold by between 5-fold and 50-fold.

28. (new) The macroscopic scaffold of claim 1, wherein said cells are autologous or allogeneic with respect to a subject.

29. (new) The macroscopic scaffold of claim 1, wherein said macroscopic scaffold is pre-shaped to fit a tissue defect.

30. (new) The macroscopic scaffold of claim 1, wherein said macroscopic scaffold is subjected to static or dynamic compression or a combination thereof.

31. (new) The macroscopic scaffold of claim 1, wherein said cells are present in said macroscopic scaffold at a concentration of between 0.5 million and 15 million per ml of volume of the macroscopic scaffold.

32. (new) The macroscopic scaffold of claim 1, wherein said cells divide after encapsulation within the macroscopic scaffold.